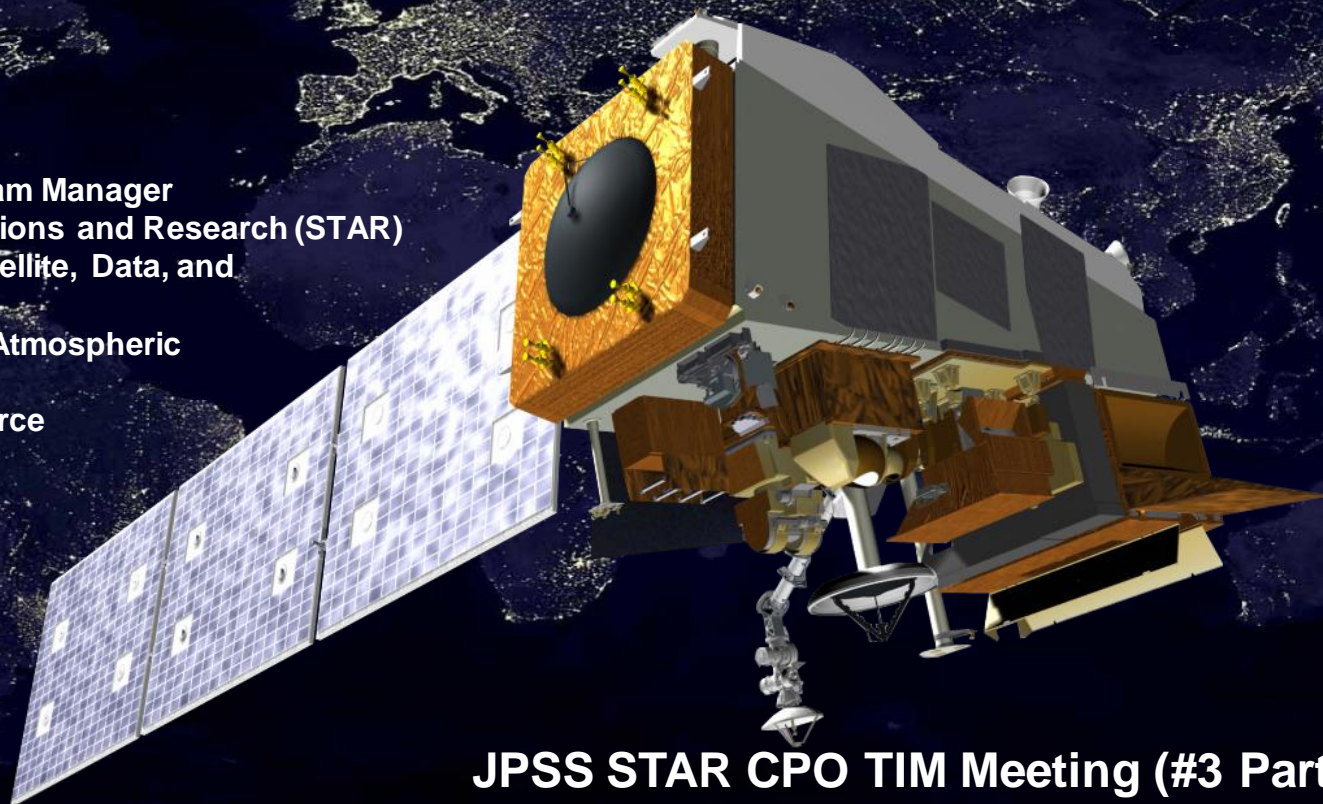


# Joint Polar Satellite System (JPSS)

## *JPSS-CPO TIM : Introduction*

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JPSS STAR CPO TIM Meeting (#3 Part I)  
March 29<sup>th</sup> 2017

# Background of JPSS-STAR-CPO TIM #3 Part I

- Why JPSS-STAR-CPO TIMs: Enhance Science Outreach; Collaboration; Ensure the products developments are consistent with Users' needs and priorities
- JPSS-CPO Kick Off Meeting Sept 12 2016:
  - JPSS Program Scientist (Mitch Goldberg) briefed on JPSS products and applications
  - CPO Introduced major programs, Portfolio distributions, STAR collaborators, Linkage to JPSS
- Action from the kick off: To organize the follow up 3 technical interchange meetings (TIMs) to have in-depth discussions in specific potential collaboration:
  - #1 AC4/Atmospheric Composition Products (Nov 18 2016);
    - <https://www.star.nesdis.noaa.gov/jpss/meetings2016.php#S961212>
  - #2 Data Assimilation (Jan 30 2017); Report in final preparation -> NOAA tech report
  - #3 Arctic Part I (March 29<sup>st</sup> 2017)
  - Arctic Part 2 (Late April 2017)
  - Possible TIM #4: JPSS Products for NWP Model Verification Applications

# Arctic TIM

- Purpose of today's TIM:
  - Communicate info about JPSS products (e.g., data variables, length, resolution, quality) and other NESDIS products, with focus on arctic applications
  - Communicate info about corresponding CPO programs: Arctic program
  - Understand users' needs - for this meeting, to understand the needs for data assimilation and earth system modeling for research and operational prediction
  - Learn the current state of services/applications, what improvements are still needed, and how satellite data can help
  - Explore potential applications and products
  - Discuss collaboration mechanisms and costs
- TIM POCs:
  - Veronica Lance/Murty Divakarla (STAR), Sandy Starkweather (CPO)
- Outcome:
  - TIM Report:
    - Identify high priority JPSS products for data assimilation needs
    - Summary of the presentations/discussions
    - Further actions on collaborations
    - Recommendations to JPSS-STAR/CPO Programs

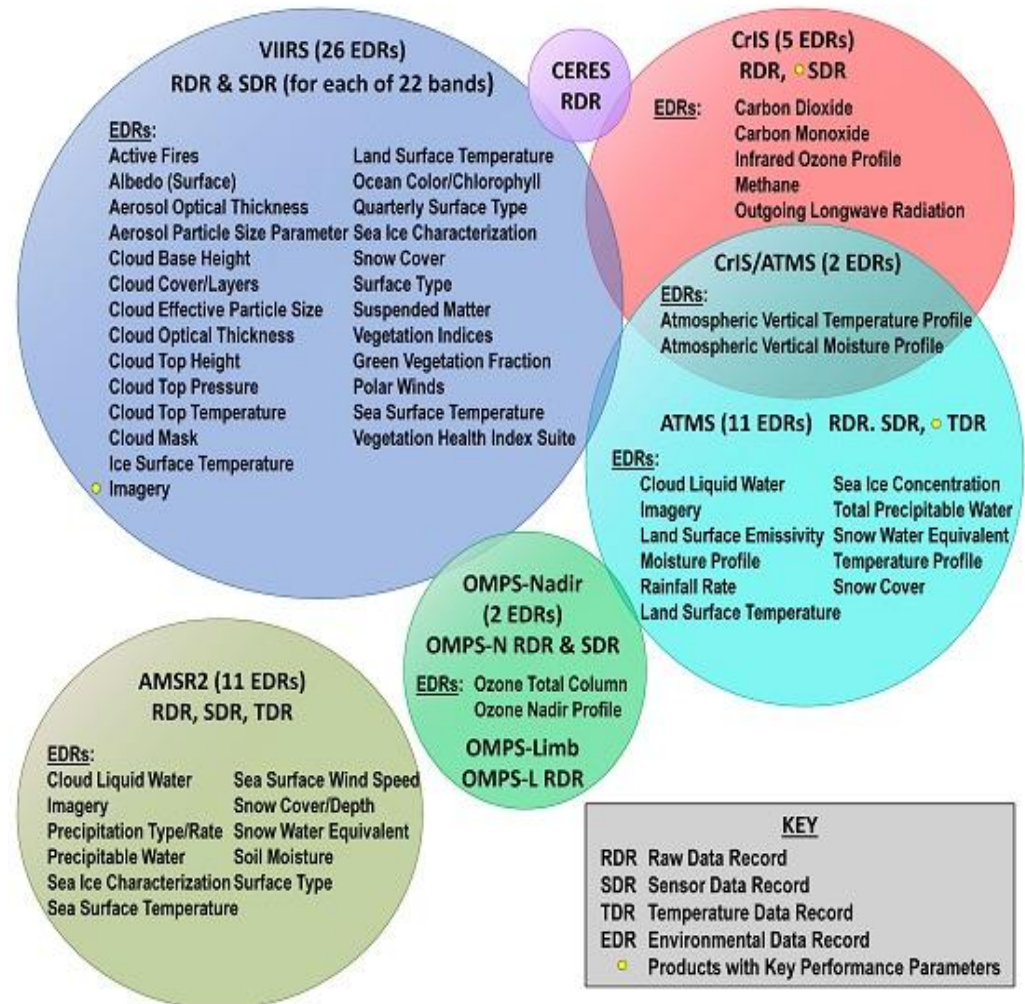


# JPSS Instruments and Products

SNPP on orbit since Oct 2011; J1 will be launched Sept 2017

JPSS Instruments	Measurements
<b>ATMS</b> - Advanced Technology Microwave Sounder	ATMS and CrIS together provide high vertical resolution temperature and water vapor information needed <b>to maintain and improve forecast skill out to 5 to 7 days in advance</b> for extreme weather events, including hurricanes and severe weather outbreaks
<b>CrIS</b> - Cross-track Infrared Sounder	
<b>VIIRS</b> – Visible Infrared Imaging Radiometer Suite	VIIRS provides many critical imagery products including snow/ice cover, clouds, fog, aerosols, fire, smoke plumes, vegetation health, phytoplankton abundance/chlorophyll, <b>Day night band provide new capabilities!</b>
<b>OMPS</b> - Ozone Mapping and Profiler Suite	<b>Ozone</b> spectrometers for monitoring ozone hole and recovery of stratospheric ozone and for UV index forecasts
<b>CERES</b> - Clouds and the Earth's Radiant Energy System	Scanning radiometer which supports studies of Earth Radiation Budget (ERB)

## JPSS Program Data Products



# Suomi NPP Data Product Maturity Status (1/3)

Sensor	Algorithm	Priority	Beta	Provisional	Validated
ATMS	SDR	1	Jan-12	Oct-12	Dec-13
ATMS	Land Surface Emissivity (LSE)	2	Apr-12	Aug-14	*
ATMS	Total Precipitable Water (TPW)	3	Apr-12	Aug-14	Oct-16
ATMS	Rainfall Rate	3	Apr-12	Aug-14	Oct-16
ATMS	Cloud Liquid Water (CLW)	3	Apr-12	Aug-14	*
ATMS	Sea Ice Characterization (SIC)	3	Apr-12	Aug-14	*
ATMS	Snow Cover/Depth	3	Apr-12	Aug-14	*
ATMS	Snow-Water Equivalent (SWE)	3	Apr-12	Aug-14	*
ATMS	Moisture Profile	4	Apr-12	Aug-14	Oct-16
ATMS	Temperature Profile	4	Apr-12	Aug-14	Oct-16
ATMS	Land Surface Temperature (LST)	4	Apr-12	Aug-14	*
VIIRS	SDR	1	Apr-12	Oct-12	Dec-13
VIIRS	Imagery (Not Near-Constant Contrast)	1	May-12	Jan-13	Jan-14
VIIRS	Imagery (Near-Constant Contrast)	1	Oct-12	Aug-13	Jan-14
VIIRS	Ocean Color (OCC)	2	Jan-13	Jan-14	Mar-15
VIIRS	Sea Surface Temperature (SST)	2	Feb-13	Jan-14	Sep-14
VIIRS	VIIRS Polar Winds	2	---	Mar-14	Oct-16
VIIRS	Aerosols - Suspended Matter (SM) <sup>1</sup>	3	Jun-13		
VIIRS	Aerosol Optical Thickness (AOT)	4	Sep-12	Apr-13	Aug-14
VIIRS	Aerosol Particle Size (APSP)	4	Sep-12	Apr-13	Aug-14
VIIRS	Cloud Mask (VCM)	3	Jun-12	Jan-13	Jan-14
VIIRS	Cloud Optical Properties (daytime)	3	Jun-13	Jan-14	Sep-14
VIIRS	Cloud Optical Properties (nighttime)	3	Jun-13	Jan-14	Sep-14
VIIRS	Cloud Cover Layer (CC/L)	3	Jun-13	Jan-14	Sep-14
VIIRS	Cloud Top Height (CTH)	3	Jun-13	Jan-14	Sep-14
VIIRS	Cloud Top Temperature (CTP)	4	Jun-13	Jan-14	Sep-14

# Suomi NPP Data Product Maturity Status (2/3)

VIIRS	Cloud Top Pressure (CTP)	4	Jun-13	Jan-14	Sep-14
VIIRS	Cloud Base Height (CBH)	4	Jun-13	Jan-14	Sep-14
VIIRS	Binary Snow Cover	3	May-13	Nov-13	Jan-14
VIIRS	Snow Cover Fraction	3	May-13	Nov-13	Sep-14
VIIRS	Sea Ice Concentration IP <sup>2</sup>		May-13	Nov-13	---
VIIRS	Sea Ice Characterization (SIC)	3	May-13	Nov-13	Sep-14
VIIRS	Ice Surface Temperature (IST)	4	May-13	Aug-13	Jan-14
VIIRS	Active Fires (AF)	3	Oct-12	Aug-13	Sep-14
VIIRS	Land Surface Temperature (LST)	4	Dec-12	Apr-13	Dec-14
VIIRS	Land Surface Albedo (LSA)	4	Jun-13	Apr-14	Dec-14
VIIRS	Surface Type (ST)	4	Feb-13	Jan-14	Dec-14
VIIRS	Land Surface Reflectance (SR)	4	Feb-13	Aug-13	Sep-14
VIIRS	Vegetation Index (VI)	4	Feb-13	Aug-13	Sep-14
VIIRS	Green Vegetation Fraction (GVF)	2	Jan-13	Aug-13	Oct-16
VIIRS	Vegetation Health Index Suite	4	Jun-14	Jun-15	Oct-16
CrIS	SDR	1	Apr-12	Oct-12	Dec-13
CrIS/ATMS	Atm. Vertical Moisture Profile (AVMP)	3	Aug-12	Jan-13	Sep-14
CrIS/ATMS	Atm. Vertical Temperature Profile (AVTP)	3	Aug-12	Jan-13	Sep-14
CrIS	Ozone Profile EDR	3	---	Jan-13	Oct-16
CrIS/ATMS	Carbon Monoxide	4	---	Jan-13	**
CrIS/ATMS	Carbon Dioxide	4	---	Jan-13	**
CrIS/ATMS	Methane	4	---	Jan-13	**

# Suomi NPP Data Product Maturity Status (3/3)

CrIS	Outgoing Longwave Radiation EDR	3	Dec-13	Sep-15	Oct-16
OMPS	Total Column SDR	3	Feb-12	Oct-12	Aug-15
OMPS	Nadir Profiler SDR	3	Feb-12	Oct-12	Aug-15
OMPS	Total Column Ozone EDR	3	Jul-12	Jan-13	Aug-15
OMPS	Nadir Profiler Ozone EDR	3	Aug-12	Jan-13	Aug-15
AMSR	Sea Surface Temperature (SST)	2	May-13	Apr-14	Oct-16
AMSR	Microwave Imagery	3	May-13	Apr-14	Oct-16
AMSR	Cloud Liquid Water (CLW)	3	May-13	Apr-14	Oct-16
AMSR	Precipitation (Type/Rate)	3	May-13	Apr-14	Oct-16
AMSR	Total Precipitable Water (TPW)	3	May-13	Apr-14	Oct-16
AMSR	Sea Surface Wind Speed	3	May-13	Apr-14	Oct-16
AMSR	Sea Ice Characterization	3	May-13	May-16	*
AMSR	Snow Cover/Depth	3	May-13	May-16	*
AMSR	Snow-Water Equivalent (SWE)	3	May-13	May-16	*
AMSR	Soil Moisture	3	May-13	May-16	*

# SNPP Mission Lifecycle Reprocessing Datasets

Algorithm/ Product	S-NPP Reprocessed Data Availability				
	Reprocessing Efforts/Future Plans	Reprocessing System	Version	Start Date	End Date
ATMS	Attempts to complete S-NPP Mission-long SDR reprocessing are on-going. Reprocessed SDRs have been validated and EDR teams are evaluating EDR product improvements using reprocessed SDRs.	ATMS		11/8/2011	8/31/2016
VIIRS		VIIRS		5/20/2012	5/28/2012
				12/15/2012	12/21/2012
				7/6/2015	7/12/2015
				10/18/2015	10/24/2015
CrIS		CrIS-TSR		2/20/2012	8/31/2016
		CrIS-FSR		TBD	TBD
OMPS-TC		OMPS-TC		1/26/2012	9/9/2015
OMPS-NM		OMPS-NM		1/26/2012	9/9/2015
Location	Reprocessed: /data/data263/gregk/VIIRS_SDR/ IDPS equivalent: /data/data263/gregk/VIIRS_SDR_Ops/				



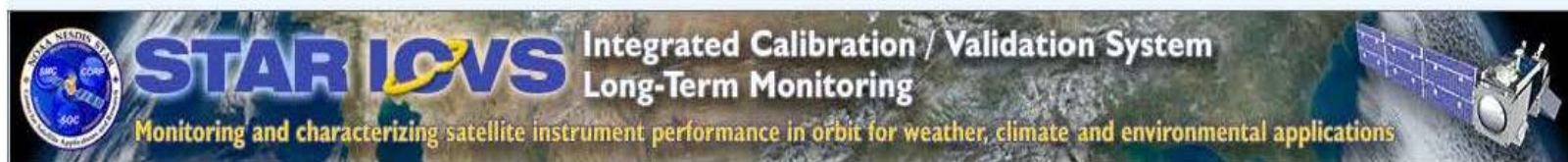
# Summary

- ✓ Most of S-NPP data products have reached the Validated maturity level
- ✓ Operational production with mature algorithms is now ongoing
- ✓ Extensive outreach, supports to PGRR initiatives and users engagements, resulting in critical operational applications
- ✓ Reprocessing of the data record with highest quality input and most mature algorithms is ongoing
- ✓ Closely engaged with the JPSS-1 launch readiness testing activities, plans are in place for JPSS-1 Cal Val



<http://www.star.nesdis.noaa.gov/jpss>

- ATBDs
- Cal/Val Docs
- OAD and CDFCB
- Requirements Documents
- Algorithm and Data Products Performance



<http://www.star.nesdis.noaa.gov/icvs/>

- Provide real-time environmental satellites performance monitoring.
- Reduce the uncertainty in climate trend detection and prediction through vigorous calibration and reprocessing.
- Increase accuracy of satellite data for weather and environmental prediction models.
- Smoothly transition new calibration algorithms to operations.
- Develop common practices for calibration of Earth observation sensors.
- Achieve traceability to the International System of Units (SI)
- Optimize sensor choice and design for achieving these goals.

## Community Satellite Processing Package (CSPP)

<http://cimss.ssec.wisc.edu/cspp/>

- The Community Satellite Processing Package (CSPP) supports the Direct Broadcast (DB) meteorological and environmental satellite community through the packaging and distribution of open source science software.